

Appl. No.: 10/812,748
Amdt. dated: 10/03/2005
Reply to Office Action 09/21/2005

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (currently amended): A vehicle transporter comprising:

- (a) a vehicular frame;
- (b) a vehicle support member movable relative to said vehicular frame; and
- (c) a screw actuator having elongate members that slide longitudinally relative to each other in response to turning of a screw so as to alter a length of said actuator, and having a connection to said vehicular frame and a connection to said vehicle support member so that altering said length of said screw actuator will cause said vehicle support member to move relative to said vehicular frame, rotation of said screw forcing said elongate members to slide longitudinally relative to each other.

Claim 2 (previously presented): The vehicle transporter of claim 1 wherein said screw actuator comprises:

- (a) a tubular shell connectible to one of said vehicular frame and said vehicle support member, said tubular shell comprising a wall defining an exterior and an interior;
- (b) a slide tube having a first end connectible to the other of said vehicular frame and said vehicle support member, a second end, and a slide tube wall connecting said first end and said second end and defining a slide tube interior and a slide tube exterior, said slide tube exterior being slidably arranged in said interior of said tubular shell;
- (c) a guide in sliding engagement with said slide tube interior;
- (d) a screw having a threaded portion, a first end arranged for rotation of said screw in said interior of said tubular shell, and a second end rotatably supported by said guide; and
- (e) a nut constrained to translate with said slide tube and in threaded engagement with said threaded portion of said screw so that rotation of

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said screw will cause said slide tube to translate in said tubular shell
altering said length of said screw actuator.

Claim 3 (original): The vehicle transporter of claim 2 wherein said screw actuator further comprises a follower nut in threaded engagement with said screw and in sliding engagement with said interior of said tubular shell.

Claim 4 (original): The vehicle transporter of claim 2 wherein said screw actuator further comprises a motor including a frame connected to said tubular shell and a shaft rotatable in said frame and drivingly connected to rotate said screw.

Claim 5 (original): The vehicle transporter of claim 2 wherein said threaded portion of said screw is arranged so that said threaded engagement of said nut and said screw is self-locking to prevent forces tending to translate said slide tube from causing rotation of said screw.

Claim 6 (original): The vehicle transporter of claim 2 wherein said threaded portion of said screw comprises an Acme thread having a lead angle not exceeding five degrees.

Claim 7 (original): The vehicle transporter of claim 2 wherein at least one of said tubular shell and said slide tube is connectible to one of said vehicular frame and said vehicle support member by a pivotal connection.

Claim 8 (original): The vehicle transporter of claim 7 wherein said screw actuator further comprises a follower nut in threaded engagement with said screw and in sliding engagement with said interior of said tubular shell.

Claim 9 (original): The vehicle transporter of claim 7 wherein said screw actuator further comprises a motor including a frame attached to said tubular shell and a shaft rotatable in said frame and drivingly connected to rotate said screw.

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Claim 10 (original): The vehicle transporter of claim 9 wherein said tubular shell is connectible to one of said vehicular frame and said vehicle support member with a pivoting connection enabling said motor and said tubular shell to pivot in unison.

Claim 11 (original): The vehicle transporter of claim 7 wherein said threaded portion of said screw is arranged so that said threaded engagement of said nut and said screw is self-locking to prevent forces tending to translate said slide tube from causing rotation of said screw.

Claim 12 (currently amended): A vehicle transporter comprising:

- (a) a vehicular frame;
- (b) a vehicle support member having a pivotally supported first end and a second end; and
- (c) a screw actuator having elongate members that slide longitudinally relative to each other in response to turning of a screw so as to alter a length of said actuator, and having a connection to said vehicular frame and a connection to said vehicle support member so that altering said length of said screw actuator will cause at least said second end of said vehicle support member to move relative to said vehicular frame, rotation of said screw forcing said elongate members to slide longitudinally relative to each other.

Claim 13 (previously presented): The vehicle transporter of claim 12 wherein said screw actuator comprises:

- (a) a tubular shell pivotally connectible to one of said vehicular frame and said vehicle support member, said tubular shell comprising a wall defining an exterior and an interior;
- (b) a slide tube having a first end, said first end having a pivotal connection to the other of said vehicular frame and said vehicle support member; a second end; and a slide tube wall connecting said first end and said second end and defining a slide tube interior and a slide tube exterior, said slide tube exterior being slidably arranged in said interior of said

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tubular shell;

- (c) a guide in sliding engagement with said slide tube interior;
- (d) a screw having a threaded portion, a first end arranged for rotation of said screw in said interior of said tubular shell, and a second end rotatably supported by said guide; and
- (e) a nut constrained to translate with said slide tube and in threaded engagement with said threaded portion of said screw so that rotation of said screw will cause said slide tube to translate in said tubular shell altering said length of said screw actuator.

Claim 14 (original): The vehicle transporter of claim 13 wherein said screw actuator further comprises a follower nut in threaded engagement with said screw and in slidable relative to said interior of said tubular shell.

Claim 15 (original): The vehicle transporter of claim 13 wherein said screw actuator further comprises a motor including a frame attached to said tubular shell and a shaft rotatable in said frame and drivingly connected to rotate said screw.

Claim 16 (original): The vehicle transporter of claim 13 wherein said threaded portion of said screw is arranged so that said threaded engagement of said nut and said screw is self-locking to prevent forces tending to translate said slide tube from causing rotation of said screw.

Claim 17 (currently amended): The vehicle transporter of claim 12 wherein said vehicular frame includes a substantially horizontal frame beam and connection of said tubular shell and said slide tube to said transporter said connections of said screw actuator to said vehicular frame and said vehicle support member define a line that is not normal to said frame beam when said screw actuator is of at least one length.

Claim 18 (previously presented): A vehicle transporter comprising:

- (a) a vehicular frame;
- (b) a first vehicle support member supported by said vehicular frame

- and selectively movable relative to said vehicular frame; and
- (c) a plurality of screw actuators, each comprising:
- (i) an elongate tubular shell comprising a wall defining an shell exterior and a shell interior, said tubular shell having a pivoting connection to at least one of said vehicular frame and said vehicle support member;
 - (ii) a slide tube having a first end, said first end having a pivotal connection to the other of said vehicular frame and said vehicle support member; a second end; and a slide tube wall connecting said first end and said second end and defining a slide tube interior and a slide tube exterior, said slide tube exterior being arranged to slide within said shell interior;
 - (iii) a guide in sliding engagement with said slide tube interior;
 - (iv) a screw including a threaded portion, a first end rotatably supported for rotation of said screw in said shell interior, and a second end rotatably supported by said guide;
 - (v) a nut restrained to said slide tube and in threaded engagement with said threaded portion of said screw so that rotation of said screw will cause said slide tube to translate in said tubular shell altering a dimension between said connection of said first end of said slide tube and said connection of said tubular shell causing said first vehicle support member to move relative to said vehicular frame;
 - (vi) a follower nut in threaded engagement with said screw and slidably bearing on said shell interior; and
 - (vi) a hydraulic motor having a frame attached to said tubular shell and a shaft selectively rotatable in said frame and drivingly connected to said screw.

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Claim 19 (currently amended): The vehicle transporter of claim 18 further comprising:

- (a) a second vehicle support member pivotally attached at a first end to said first vehicle support member; and
- (b) ~~another~~ an additional screw actuator ~~having~~ comprising an additional screw, a first pivoting connection to said vehicular frame, a second pivoting connection to said second vehicle support member, and elongate members that slide longitudinally relative to each other in response to rotation of a said additional screw to selectively vary a length between said first and said second connections causing said second vehicle support member to pivot about said first end, rotation of said additional screw forcing said elongate members to slide longitudinally relative to each other.

Claim 20 (currently amended): The vehicle transporter of claim 18 further comprising:

- (a) a ~~third~~ second vehicle support member slidably attached to said first vehicle support ~~frame~~ member; and
- (b) an additional screw actuator ~~having~~ comprising an additional screw, a first connection to said first vehicle support member, a second connection to said ~~third-second~~ vehicle support member, and elongate members that slide longitudinally relative to each other in response to rotation of a said additional screw to selectively vary a length between said first and said second connections causing said ~~third~~ second vehicle support member to translate relative to said first vehicle support member, rotation of said additional screw forcing said elongate members to slide longitudinally relative to each other.

Claim 21 (previously presented): A screw actuator comprising:

- (a) a tubular shell connectible to a first member; said tubular shell comprising a wall defining an exterior and an interior;
- (b) a slide tube having a first end, a second end, and a slide tube wall connecting said first end and said second end and defining a slide tube

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interior and a slide tube exterior, said slide tube exterior being slidably arranged in said interior of said tubular shell, said slide tube connectible to a second member;

- (c) a guide in sliding engagement with said slide tube interior;
- (d) a screw having a threaded portion and a first end rotationally supported by said guide, said screw arranged for rotation in said interior of said tubular shell; and
- (e) a nut in threaded engagement with said threaded portion of said screw and constrained to translate with said slide tube so that rotation of said screw will cause said slide tube to translate in said tubular shell altering a length of said screw actuator.

Claim 22 (original): The screw actuator of claim 21 further comprising a follower nut in threaded engagement with said screw and spaced apart from said nut.

Claim 23 (original): The screw actuator of claim 22 further comprising an indicator of contact between said follower nut and at least one of said nut and said slide tube.

Claim 24 (original): The screw actuator of claim 21 further comprising a motor including a frame connected to said tubular shell and a shaft rotatable in said frame and drivingly connected to rotate said screw.

Claim 25 (original): The screw actuator of claim 21 wherein said threaded portion of said screw is arranged so that a force tending to displace said slide tube will not cause rotation of said screw.

Claim 26 (original): The screw actuator of claim 21 wherein said threaded portion of said screw comprises an Acme thread having a lead angle not exceeding five degrees.

Claim 27 (original): The screw actuator of claim 21 wherein at least one of said tubular shell

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and said slide tube is pivotally connectible, respectively, to one of said first member and said second member.

Claim 28 (original): The screw actuator of claim 27 further comprising a follower nut in threaded engagement with said screw and spaced apart from said nut.

Claim 29 (original): The screw actuator of claim 21 further comprising:

- (a) a hydraulic motor comprising a frame attached to said tubular shell, said frame including a fluid port, and a shaft rotatable in said frame and drivingly connected to rotate said screw, said shaft rotatable by pressurized fluid at said fluid port; and
- (b) a hydraulic valve attached to one of said tubular shell and said frame of said hydraulic motor and connected to selectively block a flow of fluid to said fluid port.

Claim 30 (previously presented): A vehicle transporter comprising:

- (a) a vehicular frame;
- (b) a vehicle support member movable relative to said vehicular frame;
- (c) a screw actuator pivotally connected to said vehicular frame and said vehicle support member and having first and second elongate members that slide longitudinally relative to each other in response to rotation of a screw so as to alter a length of said actuator causing said vehicle support member to move relative to said vehicular frame; and
- (d) a motor having a motor frame connected to said first elongate member of said screw actuator and movable in unison with said first elongate member and a motor shaft rotatable in said motor frame and drivingly connected to rotate said screw.

Claim 31 (previously presented): A screw actuator comprising:

- (a) a tubular shell movably connectible to a first member; said tubular shell comprising a wall defining an exterior and an interior;

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- (b) a slide tube having a first end, a second end, and a slide tube wall connecting said first end and said second end and defining a slide tube interior and a slide tube exterior, said slide tube exterior being slidably arranged in said interior of said tubular shell, said slide tube connectible to a second member;
- (c) a screw arranged for rotation in said interior of said tubular shell;
- (d) a nut in threaded engagement with said screw and constrained to translate with said slide tube so that rotation of said screw will cause said slide tube to translate slidably in said tubular shell altering a length of said actuator; and
- (e) a motor having a motor frame attached to said tubular shell and movable in unison with said tubular shell, and a motor shaft rotatable in said motor frame and drivingly connected to rotate said screw.

Claim 33 (new): The vehicle transporter of claim 1 further comprising a motor including a motor frame and a motor shaft rotatable in said motor frame and drivingly connected to rotate said screw, said screw and said motor rotatable on a common axis.

Claim 34 (new): The vehicle transporter of claim 1 further comprising a motor including a motor frame connected to one of said elongate members and a motor shaft rotatable in said motor frame and drivingly connected to rotate said screw.

Claim 35 (new): The vehicle transporter of claim 1 wherein said screw is self-locking to prevent a force tending to slide said elongate members longitudinally relative to each other from rotating said screw.